

CLAIMS

1. A high-frequency dielectric heating device for heat-treating a material to be heated, comprising:

a microwave output unit including:

an inverter unit for inverting a direct
5 current into an alternating current of a predetermined frequency by switching a semiconductor switching element by using an inverter control circuit,

heat-radiating fins on which the
semiconductor switching element is mounted to radiate
10 the heat generated by the semiconductor switching element,

a printed board having a thermistor for
detecting the temperature of the semiconductor switching
element, the thermistor being soldered to a leg portion
15 of the semiconductor switching element or near to the leg portion thereof on the side of the soldering surface of the printed board,

a booster transformer for boosting the output
voltage of the inverter unit,

20 a high-voltage rectifier unit for doubling and rectifying the output voltage of the booster transformer, and

a magnetron for radiating the output of the
high-voltage rectifier unit as microwaves; and

25 a heat-cooking chamber fed with microwaves radiated

from the magnetron,

wherein the inverter unit has a power-down control function for permitting the output power of the inverter unit to vary depending upon the resistance of the thermistor after
5 the start of the magnetron.

2. A high-frequency dielectric heating device for heat-treating a material to be heated, comprising:

a microwave output unit including:

10 an inverter unit for inverting a direct current into an alternating current of a predetermined frequency by switching a semiconductor switching element by using an inverter control circuit,

15 heat-radiating fins on which the semiconductor switching element is mounted to radiate the heat generated by the semiconductor switching element,

20 a printed board having a thermistor for detecting the temperature of the semiconductor switching element, the thermistor being soldered to a leg portion of the semiconductor switching element or near to the leg portion thereof on the side of the soldering surface of the printed board,

25 a booster transformer for boosting the output voltage of the inverter unit,

a high-voltage rectifier unit for doubling

and rectifying the output voltage of the booster transformer, and

a magnetron for radiating the output of the high-voltage rectifier unit as microwaves; and

5 a heat-cooking chamber fed with microwaves radiated from the magnetron,

wherein the inverter unit has a power-down control function for decreasing the output power of the inverter unit down to a predetermined value when the thermistor has assumed
10 a predetermined resistance.

3. The high-frequency dielectric heating device according to claim 2,

wherein the inverter unit is provided with a start
15 control circuit which, at the start of the magnetron, controls the collector voltage of the semiconductor switching element to be lower than that of during the steady-state operation, and the start control circuit is utilized when the output power of the inverter unit is to be decreased down to
20 a predetermined value.

4. A high-frequency dielectric heating device for heat-treating a material to be heated, comprising:

a microwave output unit including:

25 an inverter unit for inverting a direct current into an alternating current of a predetermined

frequency by switching a semiconductor switching element by using an inverter control circuit,

heat-radiating fins on which the semiconductor switching element is mounted to radiate the heat generated by the semiconductor switching element,

a printed board having a thermistor for detecting the temperature of the semiconductor switching element, the thermistor being soldered to a leg portion of the semiconductor switching element or near to the leg portion thereof on the side of the soldering surface of the printed board,

a booster transformer for boosting the output voltage of the inverter unit,

a high-voltage rectifier unit for doubling and rectifying the output voltage of the booster transformer, and

a magnetron for radiating the output of the high-voltage rectifier unit as microwaves; and

a heat-cooking chamber fed with microwaves radiated from the magnetron,

wherein the inverter unit has a power-down control function for decreasing the output power of the inverter unit down to a predetermined value when the thermistor has assumed a predetermined resistance and, then, for permitting the output power of the inverter unit to vary depending upon the

resistance of the thermistor.

5. The high-frequency dielectric heating device according to any one of claims 1 to 4,

5 wherein the output power of the inverter unit is decreased down to a predetermined value when the thermistor has assumed the predetermined resistance.

6. A printed board with a thermistor comprising:

10 an inverter unit for inverting a direct current into an alternating current of a predetermined frequency by switching a semiconductor switching element;

heat-radiating fins on which the semiconductor switching element is mounted to radiate the heat generated by
15 the semiconductor switching element; and

a thermistor for detecting the temperature of the switching element,

wherein the thermistor is soldered to a leg portion of the switching element or near to the leg portion thereof
20 exposed on the side of the soldering surface of the printed board.

7. The printed board with a thermistor according to claim 6,

25 wherein the semiconductor switching element is an insulated gate bipolar transistor.

8. The printed board with a thermistor according to claim 7,

wherein the leg portion is an emitter leg of the insulated gate bipolar transistor.

9. The printed board with a thermistor according to any one of claims 6 to 8,

wherein the thermistor is a chip thermistor.

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10. A high-frequency dielectric heating device for heat-treating a material to be heated, comprising:

a microwave output unit including:

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a printed board mounting an inverter unit,

heat-radiating fins and a thermistor,

a booster transformer for boosting the output voltage of the inverter unit,

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a high-voltage rectifier unit for doubling and rectifying the output voltage of the booster transformer, and

a magnetron for radiating the output of the high-voltage rectifier unit as microwaves; and

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a heat-cooking chamber for containing a material to be heated thereby to heat-treat the material to be heated by feeding the microwaves radiated from the magnetron into the heat-cooking chamber,

wherein the inverter unit is the one mounted on a printed board with a thermistor according to any one of claims 6 to 9.